

Modernization and Technology

Situation Overview:

- A. *Detail the farm's reasoning behind the decision to pursue a modernization plan.* We realized that modernizing key areas of our facilities would provide better cow comfort and greater efficiency. Optimizing cow comfort would ultimately help us achieve our comfort goals and lead to a more profitable business.
- B. *List the key variables that impacted the decision to move ahead with the plan.* Working with consultants, such as Dan McFarland, Penn State Cooperative Extension Engineer, we identified key improvement areas. Our decision making process was further helped by researching online and in dairy publications. Dan did not perform a formal assessment, but affirmed our concerns about ventilation and overcrowding.
- C. *The following modernization areas apply to our farm and describe the incorporation of technology:*
- Young stock facilities – Curtains added for improved ventilation.
 - Milking cow facilities – Plate cooler was added to the milk house to cool the milk faster and lower the electricity bill by allowing the compressors to run less often; curtains also added to improve ventilation.
 - Other facilities – Pole barn retrofitted with 30 sand bedded free stalls.
 - Feed storage – We added concrete center wall panels to an existing bunker silo at the heifer farm to create two smaller bunkers that could be fed out quickly enough to dry cows and heifers.
 - Sand bedding - Skid loader sand shooter was purchased to bed the stalls more evenly and often.
 - Ventilation – 24-inch circulating fans were added to our tie stall barn and dry cow barns; curtains added for the young stock and milking cow facilities.

Challenges and Opportunities:

- D. *What were the different options the Transformation Team considered as they worked together to pursue this plan? Please describe.* We considered having our heifers custom raised, but ultimately elected to raise our own heifers, on a rented farm. We added milker units rather than immediately pursuing a parlor. A shale pad was constructed for corn-silage bags which provided higher-quality feed than the existing steel silo. During the planning process, the team also discussed deep bedding with manure solids, but it was deemed not feasible.

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Actions:

E. *How did the work done on a business plan or feasibility study impact the farm's final decisions?* Because of the feasibility study and business plan, a large scale expansion was ruled out in favor of smaller changes to the existing facility. The feasibility study did not show profitability for the first several years following a large scale expansion. There was also a lot of uncertainty regarding milk prices following the downturn of 2009.

Additionally, our business plan did not call for hiring full time employees. We also did not want to take on a large amount of debt to finance capital, and be faced with operating loans to keep the larger scale dairy afloat.

F. *How long did the project take, start to finish?* One year.

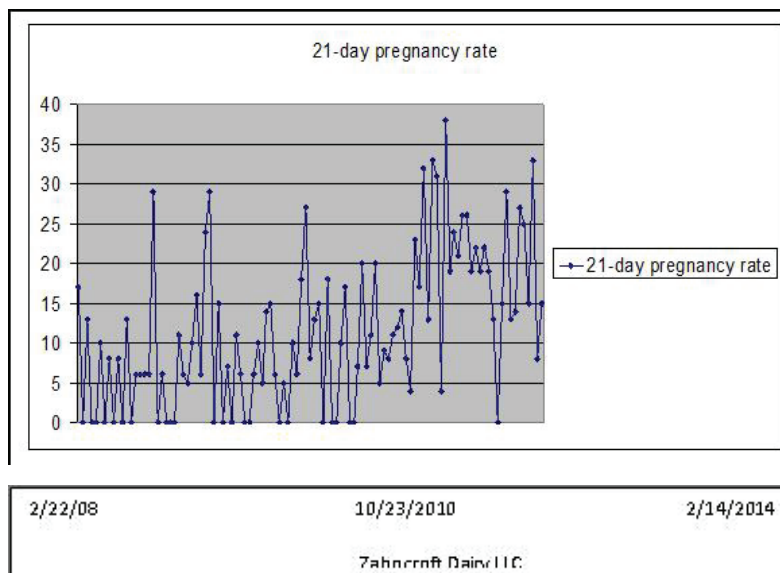
Results:

G. *How did the modernization and new technology change the business as it relates to profitability?* We made smaller capital investments that allowed us to double the herd size at a rental location, without taking on a large debt load.

H. *Can the farm quantify labor savings, energy savings or environmental impact?*

- Labor Savings: \$30,000
- Energy Savings: \$4,200
- Environmental Impact: Less erosion because of no-till practice

I. *Did the modernization and new technology change management practices on the farm? If yes, how?* Yes. The modernization project allowed us to implement some changes like running a foot bath, since cows are moving in and out of the milking barn daily. We have also been able to detect heats more accurately because cows are in loose housing and it is easy to observe them in the holding area before milking. This has led to much better heat detection and improved pregnancy rates, as illustrated in the 21-day pregnancy rate chart, at right:



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J. *What have you learned that has influenced future decision making about technology or given you new enthusiasm for some aspect of modernization?* The cows adapted to the free stalls very well. The cows definitely preferred the sand bedding, which will influence any future barn design. [Refer to the attached graphs illustrating rolling herd average and high SCC cows before and after the project changes.](#)

K. *Has the farm shared the new facilities or technology (milking facilities, manure management, etc.) with others in the dairy community?* We have shown our project work to other farmers who were considering similar projects. The response has been positive to the point that they would probably retrofit buildings in the same manner as us, understanding that switching a lot of cows out of a tie stall barn is labor-intensive but certainly cost-saving.

Our five year plan aims at further expansion of the dairy. This includes a new free stall barn and manure pit for approximately 200 cows. We are still considering a retrofitted parlor in the existing stall barn, although we are looking at robots as a viable alternative. The main reason for this would be labor, as hiring even a part-time worker has been a challenge. Family time and time off are also concerns that we would like to address.

An ideal headline in five years would read “Zahncroft Dairy has expanded while maintaining profitability and increasing production.” Although the LLC has been profitable in recent years, we understand supporting the families involved will take more cows.

